



Atty. Docket No. 7969-01  
Appln. No. 10/648,572

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Mark C. CESA et al.

Serial No.: 10/648,572

Filing Date: 26 August 2003

Title: PURIFICATION OF ACETONITRILE BY A  
DISTILLATIVE RECOVERY/ION EXCHANGE  
RESIN TREATMENT

Group No.: 1624

Examiner:  
Ebenezer O. Sackey

DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sir:

I, Mark C. Cesa, declare that:

1. I am a coinventor of and familiar with the above referenced U.S. Patent Application and am familiar with the final Office Action mailed 07 December 2007 and with the cited references including U.S. Patent 4,362,603 ("Presson").

I hereby certify that this correspondence (along with any paper referred to as being attached or enclosed) is being facsimile transmitted or deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

TEODI TRIGGS  
JUNE 7, 2007  
Date

Teddi Triggs  
Signature

2. I received a Bachelor of Science degree in Chemistry from Princeton University in 1974. I received a Doctor of Philosophy degree in Chemistry from the University of Wisconsin – Madison in 1979. I currently am employed by INEOS USA LLC, a company acquired from BP America in December, 2005. However, I have been employed with INEOS USA LLC and its predecessor companies (including BP Amoco Chemical Company, BP Chemicals Inc., and Standard Oil of Ohio) since 1979 as a chemist, and I am responsible for process chemistry and technical support relating to our acrylonitrile production technology. I am a coinventor of more than 25 patents in the field of organic chemistry with a particular focus on nitrile compounds and related structures.

3. Acetonitrile is produced as a by-product in the production of acrylonitrile. Some “world-scale” acrylonitrile production plants (i.e.  $\geq$  about 200,000 MTA) are equipped with acetonitrile purification sections to recover and purify this by-product. The above identified patent application relates to process for the production of HPLC (high performance liquid chromatography) acetonitrile (i.e. highly purified acetonitrile having a UV cutoff for impurities of  $<190$  nm). This process as more fully described in the specification and claims of the application is characterized by two key features, (i) operating the three distillation columns in the acetonitrile purification section (of an acrylonitrile plant) under specific reflux ratios, to obtain a highly pure acetonitrile side stream from the third distillation column, and then (ii) passing the highly pure acetonitrile side stream through an acidic ion exchange resin to further purify said highly pure acetonitrile producing highly purified acetonitrile having a UV cutoff for impurities of  $<190$  nm. The claimed reflux ratio parameters are necessary to limit impurities such as acrylonitrile, crotononitrile, and crotonaldehyde. The acidic ion exchange resin is used to limit impurities such as acetamide, oxazole and 2-aminopropionitrile. This combination of treatment steps is necessary in order to obtain the highly purified acetonitrile having a UV cutoff for impurities of  $<190$  nm (i.e. HPLC acetonitrile).

4. As disclosed above, I have been a chemist responsible for process chemistry and technical support relating to our acrylonitrile production technology since 1986. In this role, I have been very familiar with the development and evolution of our acetonitrile purification technology including the process described in U.S. Patent 4,362,603 to Presson et al.

(and assigned to the Standard Oil Company). When the process described in U.S. Patent 4,362,603 was previously practiced commercially in our acrylonitrile process plants, it did not yield highly purified acetonitrile having a UV cutoff for impurities of <190 nm (i.e. HPLC acetonitrile) because of lower reflux ratios and the lack of the ion exchange resin. It was not until after the implementation of the instant invention in our acrylonitrile process plants that highly purified acetonitrile having a UV cutoff for impurities of <190 nm (i.e. HPLC acetonitrile) was able to be produced in our plants in commercial quantities.

5. I hereby declare that all statements made herein of my own knowledge and are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,



Mark C. Cesa

Date 4/7/07